

## ELECTRICITY IN BULK.

HOWEVER, far we may still be from a proper understanding of the actual nature of the phenomena connected with the production of electrical energy, the past twenty years has clearly shown that in its economic aspects it follows certain well established laws. Just as the great increase in the scale of wholesale production and the invention of new and more rapid means of distribution enables the big manufacturer and stores to compete with the local workshop, or shopkeeper, so the lower first cost of producing electricity on a large scale, and the higher electrical pressures used in its transmission, enable the central authority to compete with the smaller local source of production.

The economy of concentration and bulk production of electricity was recognised by Ferranti nearly twenty years ago, and that his attempt to carry it out at Deptford in 1889 was unsuccessful was solely due to the fact that there, as in the case of the "Great Eastern," the idea was in advance of the state of manufacturing knowledge.

The size of units proposed for the Deptford station in 1889, 10,000 h.p., and the pressure used, 10,000 volts, have since been exceeded, and the latest serious proposal for the supply of electricity wholesale to London, was based upon 20,000 h.p. units, and 20,000 volts pressure. But although the premature attempt to concentrate electricity production at Deptford did not meet with the success it deserved, the correctness of the principle was not lost sight of. Another company, the Metropolitan Electric Supply Company, in the succeeding ten years carried out a policy of partial concentration in its own area, abolishing a number of small stations in the West End, and replacing them by a larger station at Willesden. But nothing so radical has taken place in electricity as has been the case in gas supply. The Ordnance Maps of forty years ago recall the existence of some seventeen or eighteen gas works, scattered throughout the Metropolitan area, nearly all of which have now been dismantled. To-day, 90 per cent. of the gas used in London is produced at Beckton, on the Greenwich Marshes, or at Nine Elms.

There are still, however, more than seventy electric generating stations in Greater London, and at present little prospect of their number being reduced. For Parliament has now rejected the third and last possible alternative for solving this knotty but urgent problem. The freedom with which the process of concentration was carried out in the case of gas arose largely from the fact that the undertakings were entirely in private hands, and that no political questions were raised in connection with their abolition.

The need for improvement, and the technical soundness of the methods suggested for improving existing electrical conditions, have now been generally admitted, both by those who favour municipalisation and those who favour private enterprise under municipal control. The fact that the existing stations, which have cost 45*l.* to 50*l.* per kw., could now be built for 10*l.* per kw., that the present cost of production is more than 1*d.* per unit, and in a new station need only be 0·2*d.* per unit, that the consumption of electricity in London is only one-tenth of that in other great cities, are no longer questions of discussion.

During the past three years three serious attempts have been made to carry out a similar concentration, the first by private enterprise, and the second by the London County Council. Although the first only failed to become law by a few days, neither of these proposals succeeded in obtaining Parliamentary sanction. It was, therefore, hoped that the third and last

alternative, that of co-operation between municipal and private enterprise, which was put before Parliament this year, would have been more successful. The fact that it also shared the fate of the previous proposals, and has been rejected, is therefore the more to be regretted, for it appears as though the scientific solution of London's electricity supply difficulties will now be indefinitely postponed. Private enterprise cannot be expected perpetually to provide the money for promoting schemes which are endorsed by Parliamentary Committees on their merits and rejected by the House of Commons on political grounds. The London County Council naturally does not feel justified in making further proposals for establishing a wholesale supply of electricity at the ratepayers' expense, in view of the recent elections. The supporters of complete municipalisation, however, have indicated that they are unwilling to agree to any proposal other than one for the complete municipalisation of electricity supply, and hence the present deadlock.

## NOTES.

WE are glad to be able to notify that the honour of a knighthood of the Most Honourable Order of the Bath (Civil Division) has been conferred upon Sir Archibald Geikie.

THE *Times* announces the death of Dr. W. D. Miller, professor of odontology at Michigan University, the author of many treatises on the teeth, and until last year professor of odontology in the University of Berlin.

By the death of Angelo Heilprin on July 17, at the age of fifty-four, science loses an enthusiastic naturalist, geologist, and explorer. He was born in Hungary, but at an early age emigrated with his parents to the United States. His education was completed in England at the Royal School of Mines during the years 1874-7, when he showed especial aptitude for natural history and gained the Edward Forbes medal. Returning to the United States, he was in 1879 appointed professor of invertebrate palæontology and curator in charge of the Academy of Natural Sciences at Philadelphia, and for a time he was professor of geology at the Wagner Free Institute of Science in the same city. He was author of a handbook on the local "town geology," of a memoir on the Tertiary geology of the United States (1884), as well as of works on the Bermuda Islands and west coast of Florida. For the International Scientific Series he wrote the "Geographical and Geological Distribution of Animals" (1887). He was author of an essay on the Arctic problem, and in 1892 he led the Peary relief expedition to the Polar regions. In later years he turned to volcanic phenomena. In 1902 he visited Mont Pelée while it was still in eruption, and wrote a work entitled "Mont Pelée and the Tragedy of Martinique" (ed. 2, 1903); while in a recent article, published in *Science* (New York, 1906), he discussed the "Concurrence and Interrelation of Volcanic and Seismic Phenomena."

THE first meeting of the Italian Association for the Advancement of Science will take place at Parma from September 23 to 29. According to the *Lancet*, the medical sciences will be strongly represented, particularly in anatomy, human and comparative; and the section devoted to anthropology, ethnography, and palæoethnology will have special attractions because of its programme. It is expected also that fresh light will be thrown at the meeting upon the subjects of forest growth, rainfall, and hygiene.

THE second International Congress on Physiotherapy will meet in Rome under the presidency of Senator Guido Baccelli in October next, and bids fair to be a great success, representatives from Great Britain, France, Germany, Austria, Denmark, Sweden, Norway, Belgium, Holland, Switzerland, and Japan having already intimated their intention of being present. The Italian Government is granting special travelling facilities to those attending the congress. The general secretary of the congress is Prof. Carlo Colombo, Via Plinio, Rome. The English secretary is Mr. W. Deane Butcher, Holyrood, Ealing.

A REUTER telegram from New York states that the main expedition of the Peary Arctic Club has been postponed for a year in consequence of the new boilers in the *Roosevelt* having been delayed; the vessel meanwhile is to be taken to Etah, Greenland, for the purpose of establishing a coal depôt, and will return by the end of September.

ACCORDING to the *Athenaeum*, a scientific expedition for the exploration of Central Asia has been organised by the Russian Geographical Society. It will be under the leadership of M. Kozlow, and will leave in October next. The expedition proposes to spend two years in the close examination of southern Mongolia and the western parts of the Chinese provinces of Kansuh and Szechuen. It is stated by our contemporary that the entire cost of the expedition will be borne by the Czar.

It is stated in the *Western Electrician* that wireless telegraph stations have been erected on Spitsbergen and at Hammerfest and Trömso in order that wireless communication may be kept up with the Wellman Arctic Expedition.

ACCORDING to the *Electrical Review*, a committee of inquiry into the question of electric-railway working in the United States is about to leave Berlin for New York, in connection with the long-discussed scheme for the introduction of electric traction on German railways, and particularly on the Berlin city railways. The committee intends to inspect, among other lines, the Baltimore-Washington-Annapolis Railway, which is equipped on the Westinghouse single-phase system, together with the elevated and tunnel railways in the United States. It is stated that the Berlin State Railway Administration will soon prepare plans for the conversion of certain lines as a result of a recent order made by the Minister for Railways, although nothing of practical value can really be accomplished until the return of the committee and the presentation of its conclusions.

THE Mississippi Valley Laboratory of the United States Department of Agriculture has, according to *Science*, been abolished, and the work in forest pathology will in future be carried on at Washington, D.C.

THE Alvarenga prize of the College of Physicians of Philadelphia for the present year has been awarded to Dr. W. Louis Chapman for his investigations on "Post-operative Phlebitis, Thrombosis and Embolism."

THE council of the Selborne Society has for some time had under its consideration a suggestion that the work of the society could be done much more efficiently if sections were formed, consisting of members specially interested in any particular objects. It is thought, for example, that one group of members might deal with the protection of plants, another with the question of the wearing of leathers, a third with the preservation of ancient buildings,

a fourth with that of places of natural beauty, a fifth with general amenities, and so on. The matter has now been referred to the general purposes committee, and members who are interested in any matter coming within the society's objects are invited to communicate with the honorary general secretary, that a report may be made to the council as to the possibility of carrying out the idea.

THE Gypsy Lore Society, which was founded in 1888 and met an untimely end four years later, has now been revived, with its headquarters at 6 Hope Place, Liverpool. The first number of the new *Journal* illustrates the difficulties which surround the problem of the origin of this mysterious people. The most important contribution is Mr. John Sampson's article on "Gypsy Language and Origin," which contains a useful summary of the literature of the subject. The linguistic evidence seems to connect the Gypsy speech of Europe with that of Kashmir or Dardistan, but the intervening links, particularly the dialects of Syria and Armenia, are still little known, and much work remains to be done before a comparative grammar and dictionary can be compiled. The society, however, must resist the tendency to confound the ethnological with the linguistic problem. It may perhaps be admitted that the basis of Gypsy speech is to be found in that of one of the vagrant tribes of India. But it is probable that this Dravidian race element has now largely disappeared in the European branch of the tribe, and anthropometry can throw little light on the varied elements from which it has been recruited. All students of anthropology, linguistics, and folk-lore offer a friendly welcome to the revived society, which will, it may be hoped, enjoy a longer lease of life than its predecessor. It has been suggested that, with the collaboration of members of the Gypsy Lore Society, an anthropological survey of the Gypsies should be undertaken, with the view of classifying them from that point of view and determining their ethnographical position among the races of India. Members of the society who are interested in this subject, and especially those who are in a position to take part in the work, are invited to communicate with Mr. J. W. Scott Macfie, Rowton Hall, Chester.

AN institute entitled the Istituto Terapeutico Italiano has been established at Milan under the directorship of Dr. Zanon, the work of which will be the investigation of the action of new drugs, especially in regard to serum-therapy and hypodermic medication.

THE Vienna correspondent of the *Lancet* states that the new premises of the Vienna Serum Institute have been recently opened. The institute serves two distinct purposes, viz. scientific research and the preparation of sera against certain diseases for the supply of medical institutions and practitioners. It is stated that 71,506 bottles of anti-diphtheritic serum were made in the institute and sold in 1905, and 75,000 bottles in 1906, together with 7500 doses of anti-scarlatinal serum and 2000 doses of dysentery serum. Since 1906 the institute has been self-supporting, as the sale of the sera to private patients covers the cost of manufacture. The quantity of blood taken from each animal amounts to six litres (eleven pints) each time, and as this is repeated ten times a year, 110 pints of blood have to be reproduced by the organism within a year.

THE French Association for the Advancement of Science recently met at Rheims under the presidency of Dr. Henrot. In the presidential address, after remarking that with notification, isolation, and disinfection, with certain

exceptions, we may hope to stamp out infectious diseases, Dr. Henrot proceeded to deal with the question of child-life protection. Various societies have been founded in France to care for the mother, both before and after the birth of the child, and to educate the parents in the proper feeding and care of their children. For this purpose, associations for the supply of proper milk, comparable to our infants' milk depôts, have been established. Crèches also have been organised to look after the children while the mothers are at work. Children abandoned or in immoral surroundings are cared for by the State, and in France there are no less than 178,000 of these, for whom schools are established where, as they become old enough, various trades are taught. The families which have the most numerous members should be the best housed, and at Nancy the "Bureau de Bienfaisance" has provided dwellings with gardens for those families where there are children.

AN interesting report by Dr. Leslie Mackenzie and Captain A. Foster has been issued by the Scotch Education Department on a collection of statistics relative to the physical condition of children attending the public schools of the School Board for Glasgow. The figures show that the one-roomed child (i.e. the child of a family occupying one room only), whether boy or girl, is always on the average distinctly smaller and lighter than the two-roomed; the two-roomed than the three-roomed; and the three-roomed than the four-roomed. "The numbers examined are so large, and the results are so uniform that only one conclusion is possible, viz. that the poorest child suffers most in nutrition and in growth. It cannot be an accident that boys from two-roomed houses should be 11.7 lb. lighter on an average than boys from four-roomed houses and 4.7 inches smaller. Neither is it an accident that girls from one-roomed houses are, on the average, 14 lb. lighter and 5.3 inches shorter than the girls from four-roomed houses." The report contains a number of elaborate tables and diagrams.

THE Bulletin of the Johns Hopkins Hospital for June-July contains a number of papers of interest to the pathologist and physician, mostly from the laboratories of the medical clinic of the hospital. The August number of the same Bulletin is principally devoted to tuberculosis, and contains an article, by Dr. Pohlman, on "The Purple Island" by Phineas Fletcher, a seventeenth-century layman's poetical conception of the human body.

THE Journal of the Royal Sanitary Institute for August (xxviii., No. 10) contains the inaugural address by Sir Charles Cameron at the Dublin conference, in which he demonstrated how sanitation has reduced the death-rate, and discussed the questions of tuberculosis, milk supply, and infant mortality.

AFTER quoting a considerable portion of Sir H. H. Johnston's article on game protection which appeared in vol. lxxvi., p. 119 (1907), of NATURE, a writer in the *American Naturalist* for July asks the question whether we cannot do without furs, remarking that the lack of "buff robes" due to the extermination of the bison is not felt in America. He then goes on to raise a protest against collecting skins and eggs for museum purposes, observing that their scientific value is but slight, while it is a question whether oology has any right to rank as a science at all. In his opinion a museum with specimens of species as rare in collections as the great auk is of less value for educational purposes than a barn

where swallows nest. "In these days of inexpensive and quite accurate pictures, collections are not necessary for identification, and science is advanced by detailed studies of common forms, rather than by collecting luna and imperial moths."

THE July number of the *Emu* (forming the first part of vol. vii.) opens with an account by Mr. Batey of the changes which have taken place in the bird-life on an estate of fifteen thousand acres in Victoria during the last sixty years. In its early days the tract was a veritable bird paradise, but, largely owing to the felling of its timber, many of the species have now completely disappeared, some of them from an area of much wider extent than that occupied by the estate. Wedge-tailed eagles abounded in 1846, and but little effect was made on their numbers by the shot-guns then in use, although the introduction of strychnine soon led to their practical extermination.

THE July issue of the *American Naturalist* opens with some interesting personal reminiscences of Louis Agassiz related by Mr. C. W. Eliot at a meeting of the "Saturday Club" in connection with the Agassiz centenary. Emphasis is laid on the great naturalist's eminence as a teacher and expositor, and the novel methods of education he adopted. The son of a distinguished surgeon was, for instance, set to study a few trilobites, upon which he was expected to work for several weeks without any aid from books or illustrations, and at the same time to be his own artist. His powers of organisation and of obtaining financial support were also very noteworthy in these early days of science teaching. Years ago it was remarked that "Agassiz will get more money out of the Commonwealth of Massachusetts for his subjects than any of you have dreamed of getting, than any of you could possibly get; but he will so equip his subject, he will set such a standard for collections in all subjects, that every department of learning in the University will profit by his achievements." These words have proved absolutely prophetic.

IN the August issue (No. 3) of *British Birds*, Miss E. L. Turner announces that the ruff has made its re-appearance as a breeding species in Norfolk, where the last known nest was recorded so long ago as 1889. In June of the present year a keeper discovered a reeve's nest containing four eggs, which, together with the parent bird, was successfully photographed. It is probable that another pair of ruffs also nested in the county during the present summer, while as young birds were killed during the two previous seasons, there is reason to believe that the species has nested in Norfolk since 1904. Ruffs have been reported as breeding in Yorkshire in 1901 and the two succeeding years. In the same issue Mr. F. Smalley points out that the alleged occurrence of the Pacific eider-duck (*Somateria v-nigrum*) in the British Isles is due to ornithologists having failed to recognise that drakes of the ordinary eider-duck may show a faint dark chevron on the throat. A specimen of the Sardinian warbler (*Sylvia melanocephala*), killed near Hastings in June last, definitely adds another species to the British list.

WE have received a memoir by Dr. Allan A. Tenney on "Social Democracy and Population," issued in the series of "Studies in History, Economics and Public Law" of Columbia University. By "social democracy" the author means "that form of society . . . in which every man has a chance and knows that he has it," a form of society based primarily on the maintenance of a



reasonable plane of living for all, and it is the object of the essay to discuss the influence of biological factors on such a form of society, assuming it possible of attainment. Thus the maintenance of a social democracy requires a rate of increase of population that is not too rapid as compared with the rate of progress in the arts; this probably implies that the democracy would be outstripped in population by nations of a lower standard of living, and hence might be only capable of survival in the case of a nation living in an easily defended situation. The low rate of increase postulated would not, the author considers, sensibly lessen the action of selection, as the latter acts in too many ways, nor would it be likely to lead to degeneration. But a recognition of the existence of hereditary individual differences and of the importance of selection is sufficient to warrant "conscious social interference in the biological process," interference which already takes place in such matters as the control of immigration. The question arises whether the principle should not be extended for the purpose of maintaining the level of natural ability in the population. As regards the United States, the author considers that the attainment of social democracy should be possible if they do not enter into the struggle for foreign markets in competition with peoples of a lower plane of living.

In the *Journal of the Society of Arts* for July 26 Mr. T. E. Younge gives an account of the "sand-counter" ( $\psi\alpha\mu\mu\iota\tau\eta\varsigma$ ) of Archimedes, which may help to revive popular interest in this very remarkable tract. Practically, Archimedes uses a scale of notation the radix of which is a myriad (10,000), and shows that by means of this scale it is possible to estimate the number of grains of sand in a sphere of the size of the earth. His estimate, of course, is only approximate, and his data imperfect; but considering the state of Greek science at the time, it is a most interesting achievement, and it is quite clear that Archimedes could have used more exact data with equal facility. Mr. Younge has checked Archimedes' numerical calculations, and found them all correct.

In the *Monthly Weather Review* for April, issued by the U.S. Department of Agriculture, Mr. H. Helm Clayton proposes a new method of weather forecasting by analysis of atmospheric conditions into waves of different lengths. Data in support of his theory were published by the author in the *American Meteorological Journal* of July, 1885, and June, 1891, and after further research into the laws underlying the drift of weather conditions he concludes that the meteorological elements at any place may be analysed into oscillations or waves differing in length, each having a distinct physical existence; further, that the waves drift generally from west to east, with a velocity inversely proportional to their length. Specimens of the movements of pressure and temperature waves over the United States illustrate the investigation, and the author considers that the results not only open the way to an improvement in forecasting weather from day to day, but furnish a scientific basis for long-range forecasts.

PROF. H. EBERT describes in the March number of *Terrestrial Magnetism* an extremely sensitive arrangement he has used for investigating the pulsations of short period in the strength of the earth's magnetic field. For observations of the vertical component, a wire 3000 metres in length is formed into a coil of fifteen turns, and is placed on the ground. In series with it is a sensitive "filament galvanometer" of the Einthoven type. Any change in the number of magnetic lines through the coil will produce a

current through the galvanometer, and the arrangement will indicate a change in the vertical component of the earth's magnetic field equal to 1/400,000 of its mean value. Prof. Ebert finds that periodic changes of certain frequencies most often occur, and one of these has the period 1/6 to 1/7 second, which is that of the oscillation of an electrical charge on a sphere of the size of the earth. The observations are being continued, and will probably play an important part in the search for an explanation of the phenomena of terrestrial magnetism.

THE Carnegie research memoirs submitted at the meeting of the Iron and Steel Institute in May last, brief summaries of which were given in *NATURE* (this vol., p. 65), have now been published in full in a special volume of the *Journal of the Institute* (vol. lxxiv.). The volume contains papers by Mr. P. Brunel (Paris), on copper steels; by Mr. W. H. Hatfield (Sheffield), on cast iron as cast and heat treated; by Mr. E. F. Law (London), on the non-metallic impurities in steel; and by Dr. O. Stutzer (Freiberg), on the geology and origin of the Lapland iron ores. There is also a paper on boron steels, by Dr. L. Guillet (Paris), received since the meeting. These steels have not hitherto been the subject of systematic investigation, and the researches described show the commercial interest attaching to these products when quenched. Boron steels will probably never prove of commercial use in the raw state, but they may prove useful after quenching. In that condition they possess high tensile strength and a remarkable degree of elasticity. The best results were obtained with a steel containing 0.50 per cent. of boron. The volume concludes with a reprint of considerable historical interest. It is an address on the effect of air and moisture on blast furnaces, delivered at Bradford in the year 1800 by Joseph Dawson, of Lowmoor.

In summarising the work of the United States Geological Survey during 1906 in the investigation of ores, Mr. S. F. Emmons directs attention to the way in which science is handicapped. The increasing exodus of members of the economic staff of the survey in consequence of their employment by large mining organisations at salaries much greater than those they have been receiving from the Government seriously impairs the efficiency of the work of this branch of the survey. The loss of trained men in this work is, for a time, irreparable, as it is only by years of practical experience in the field that the geologist becomes competent to carry on independent work of this kind.

In the *Journal of the Franklin Institute* (vol. lxxiv., No. 1) Mr. Albert Obholzer describes the methods used to avoid piping in steel ingots at the Hungarian Government steel foundries at Diosgyör. With the addition of thermite to the charge of open-hearth steel, homogeneous ingots are obtained. The method presents considerable advantages over the very successful Harmet process, which necessitates the use of elaborate machinery.

THE number of the *Bulletin of the College of Agriculture* (vol. vi., No. 3), Tokio University, lately received, contains several short papers on the physiological action of various chemical substances on plants. Prof. O. Loew and Dr. K. Aso discuss the importance of culture solutions being physiologically balanced, and allude to the use of lime in averting the injurious action of an excess of magnesium salts. They also touch upon the beneficial action of treating the soil with bactericidal substances such as carbon disulphide, attributing the effect to the breaking down of living matter. Mr. T. Takeuchi

refers to the use of shoots of *Aralia cordata*, called in Japan "udo," as a salad or a vegetable, comparable with celery or asparagus.

A SEMI-POPULAR article on the phylogeny of the various groups of the plant kingdom is contributed by Prof. M. Möbius to *Naturwissenschaftliche Wochenschrift* (June 30 and July 7). To the Flagellatæ is accorded the lowest position, from which arose the algæ, bacteria, diatoms, and other elementary groups. From the green algæ were derived the brown and red seaweeds, the connection of the latter being through Coleochætæ or through an Ulva-Bangia link. With regard to the mosses, the author favours the view that they have been derived from an early type of the Jungermanniaceæ, and that the proto-type of the ferns and fern-allies was probably a plant akin to Anthoceros. Finally, the origin of the monocotyledons is traced through the dicotyledons to the conifers, and thence back to the lycopods.

FOUR papers dealing with the identification of new plants chiefly from Mexico are published in the Proceedings of the American Academy of Arts and Sciences (July). Mr. J. M. Greenman is responsible for new species of the liliaceous genus *Schoenocaulon*; among the diagnoses prepared by Mr. M. L. Fernald are a group of *Salvias*. The collections brought by Mr. C. C. Deam from Guatemala and Mexico yielded, amongst others, *Streptochaeta sodoriana*, a grass already known from Ecuador, and a curious *Euphorbia*. The majority of the identifications by Mr. B. L. Robinson are additions to the Compositæ, and include two new genera, *Cymophora* and *Loxothysanus*, also a series of species of *Eupatorium*.

In the account of the grasses of British Somaliland contributed to the *Kew Bulletin* (No. 6), Dr. O. Stapf establishes half a dozen new species, including the economically important "durr" grass, *Andropogon cyrtocladus*, and *Sporobolus fruticosus*, another shrubby species. These shed their leaves and young shoots in the dry season, but produce large, feathery branches after the rains set in. The culms of *Panicum turgidum* and *Pennisetum dichotomum* are persistent, and form a tough fodder suited to the hard-mouthed camel. Phytogeographically the grasses of Somaliland have affinities with the grasses of Eritræa, eastern Nubia, and tropical Arabia. A considerable number of new fungi are recorded by Mr. Massee as additions to the wild fauna and flora of the gardens; a *Hypholoma* and several parasitic *Melanconiaceæ* and *Hyphyomycetæ* provide the types of new species. Mr. Botting Helmsley has a note on a new species of *Rhododendron* from China described by Mr. E. H. Wilson.

THE Annual Report and Transactions of the Manchester Microscopical Society for the year 1906 has just reached us. The society is, we are pleased to see, in a satisfactory condition. The volume before us contains the address delivered in January last by the president, Prof. S. J. Hickson, F.R.S., on "The Differentiation of Species of Coelenterata in the Shallow Water Seas," and many papers of interest to students of microscopical science.

As a member of the International Congress of Geologists meeting in Mexico in 1906, Prof. H. F. Cleland, of Williams College, took the opportunity of visiting, in the company of trained observers of the Mexican Geological Survey conversant with the regions investigated, several of the Mexican volcanoes, and describes in the August number of the *Popular Science Monthly*, under the title

of "Some Little-known Mexican Volcanoes," the volcanoes known as the Volcano Colima and the Nevado de Toluca, and the cinder cones of Valle de Santiago. The article is well illustrated.

PROF. KARL PEARSON'S Robert Boyle lecture, entitled "The Scope and Importance to the State of the Science of National Eugenics," delivered at Oxford on May 17 last, has now been issued by Mr. H. Frowde at one shilling net.

#### OUR ASTRONOMICAL COLUMN.

HELIUM ABSORPTION IN THE SOLAR SPECTRUM.—In a letter to the *Observatory* (No. 386, p. 315, August) Mr. Nagaraja, of the Kodaikanal Observatory, records the results of some further observations of the helium line,  $D_3$ , as a dark line in the spectrum of the sun. Having already frequently observed this dark line in the regions of the photosphere adjacent to sun-spots, he suspected that he had also seen it as a faint line in the ordinary solar spectrum, but for several reasons found the observation difficult to confirm. He now states that, with a recently mounted large grating spectrograph, he obtained a photograph of the  $D_3$  region on April 19, and on examination found that it shows both the darkening and the chromospheric (bright) line, where a spot was close to the limb, and, further, both the dark and the bright lines appear to be a continuation of a faint line in the normal solar spectrum. Further examination is necessary ere the identity of this faint line with the helium line can be definitely affirmed, and to this end Mr. Nagaraja proposes to carry on the research.

In the same journal Mr. A. A. Buss discusses at some length the appearance of dark and bright helium in various solar regions.

POSSIBLE CHANGES IN THE "OWL" NEBULA (M. 97).—In a paper communicated to the Royal Astronomical Society, Prof. Barnard compares the results of his recent observations of the "Owl" nebula, made with the 40-inch refractor of the Yerkes Observatory, with those made with Lord Rosse's large reflector in 1848. The latter were embodied in the well-known drawing of this object which shows a small star placed in each of the two holes, or "eyes," seen in the nebula, each star representing the pupil of the "eye" in which it was placed.

But according to Prof. Barnard's observations in recent years these stars are clear of the dark openings, and are seen on the nebulosity itself, although quite near to the dark spaces. It follows, then, that either the older drawing, which is corroborated by the observer's notes, did not correctly represent the relative positions of the stars, or that a change has occurred in the nebula, for the two stars have not changed their places in the sky. As a working hypothesis, Prof. Barnard suggests the possibility of the nebula having rotated from west to east on an axis having the position angle of  $50^\circ$ , and states that, if the velocity of rotation were great enough, the two stars in question would have occupied the positions in the holes as shown on Lord Rosse's drawing (*Monthly Notices R.A.S.*, vol. lxvii., No. 8, p. 543, June).

A QUICKLY CHANGING VARIABLE STAR.—According to the results of observations made at the Yerkes Observatory by Mr. Naozo Ichinohe, the variable star 87.1906 Draconis has the very short period of only 10h. 37m. 35s. The light increases from minimum (mag. 11.6) to maximum (mag. 10.9) in about three hours, decreases to minimum in about five hours, and remains at minimum for the remainder of the period.

An ephemeris accompanies Mr. Ichinohe's note in No. 4194 of the *Astronomische Nachrichten* (p. 293, August 2), and the position of this object, for 1906, is given as 16h. 33m. 43.3s. +  $58^\circ 2' 36''$ .

VENUS AS A LUMINOUS RING.—A brief note by Messrs. H. N. Russell and Z. Daniel, published in No. 1, vol. xxvi., of the *Astrophysical Journal* (p. 69, July), describes an observation of the ring-phase of Venus made at Prince-